

**REMARKS**

This Amendment is filed in response to the Non-Final Office Action dated September 14, 2007. Favorable reconsideration on the merits and allowance is respectfully submitted to be proper, for the reasons explained below.

In the Office Action of September 14, 2007, the sole rejection was of claims 1-2 under 35 U.S.C. § 103(a) based on US 2003/0094019 (Miyake) in view of U.S. Patent 6,454,156 (Tanaka)). In the present Amendment, claims 1, 3 and 4 have been amended to recite “eccentric core-in-sheath” by inserting the term ---eccentric--- before “core-in-sheath”. Support for this amendment can be found in the specification, e.g., at page 10, lines 31 to 34, pages 20-21 in Examples 1 and 2 and in Figures 3 and 4 (Fig. 3 and Fig. 4) and the descriptions thereof at page 10, lines 35-37 and page 11, lines 1-20.

Claim 1 has been further amended by deleting “30 to 70%” and inserting --- 40 to 60%--- with reference to thermal shrinkage. Support for this amendment can be found in the specification, e.g., at page 12, lines 4 to 6, for example.

Finally, claim 2 has been amended to improve its form. Namely, a period has been inserted at the end of the sentence.

No new matter has been added. Entry of the amendments is respectfully submitted to be proper. Upon entry of the amendments, claims 1 - 4 will be all the claims pending in the application.

**Response to Restriction Requirement**

Applicant affirms election without traverse of Group I, claims 1 - 2, drawn to a polytrimethylene terephthalate hollow composite staple fiber in response to the Restriction

Requirement dated August 13, 2007, and again notes that rejoinder of process claims 3 and 4 would appear appropriate under the circumstances of this case.

The rejection in the Office Action is addressed specifically below.

**Rejection Under 35 U.S.C. § 103(a)**

Claims 1 - 2 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 2003/0094019 to Miyake et al. ("Miyake") in view of U.S. Patent No. 6,455,156 to Tanaka et al. ("Tanaka").

Applicant traverses and respectfully requests withdrawal of the rejection in view of the following remarks.

The present invention is directed to polytrimethylene terephthalate hollow composite staple fibers having latent crimping properties and the process of manufacturing same with a high efficiency. The fibers as recited in amended claim 1 have the following features supporting a conclusion of patentability:

Feature (A): The fiber is a hollow side-by-side or eccentric core-in-sheath type composite staple fiber formed from two types of polytrimethylene terephthalate resins, different in intrinsic viscosity from each other, and having a hollow part extending along the longitudinal axis of the composite staple fiber.

Feature (B): One of the two polytrimethylene terephthalate resin components has an intrinsic viscosity in the range of from 0.50 to 1.4 dl/g, and the other one of the two polytrimethylene terephthalate resin components has an intrinsic viscosity in the range of from 0.40 to 1.30 dl/g, which is 0.1 to 0.5 dl/g below that of the polytrimethylene terephthalate resin

having the intrinsic viscosity of 0.50 to 1.40 dl/g. The intrinsic viscosities were determined in o-chlorophenol at a temperature of 35°C.

Feature (C): The cross-section of the hollow part has a cross-sectional area corresponding to 2 to 15% of the total cross-sectional area of the composite fiber.

Feature (D): The composite staple fibers exhibit an average web area thermal shrinkage of 30 to 60% determined by such a measurement that the composite staple fibers having a fiber length of 51 mm are formed into a web having a basis mass of 30 g/m<sup>2</sup> by a roller carding machine. A plurality of specimens having dimensions of 20 cm x 20 cm are prepared from the web. The specimens are heat-treated in a hot air circulation dryer at a temperature of 120°C for 10 minutes, to allow the specimens to freely shrink, the web area thermal shrinkages of the specimens are determined in accordance with Equation (1) :

$$\text{Web Area Thermal Shrinkage (\%)} = [(A - B)/A] \times 100 \quad (1)$$

wherein A represents an area of each specimen before the heat-treatment and B represents an area of the specimen after the heat-treatment, and an average of the resultant web area thermal shrinkages of the specimens is calculated.

The combination of Feature (A) with Features (B), (C) and (D) enables the resultant hollow composite staple fibers of the present invention to exhibit an improved productivity and an appropriately balanced percentage crimp and bulkiness. The advantages of the features are provided in the test results in Examples 1 and 2 shown in Table 1 in the present specification.

**Miyake (US 2003/0094019 A1)**

Miyake discloses a latent crimp fiber compositely formed from two types of poly(trimethylene terephthalate) polymers having different intrinsic viscosity in an amount of from 0.05 to 0.7 dl/g, in a side-by-side manner or in an eccentric core-sheath manner, from each other.

Miyake is silent as to a hollow composite fiber. A non-hollow (solid) side-by-side type composite poly(trimethylene terephthalate) fiber similar to that disclosed in Miyake is disclosed in Comparative Example 8 appearing on page 21, line 31 to page 22, line 1 and Table 2, in the present specification.

In Example 1 of the present application, a hollow-side-by-side type composite poly(trimethylene terephthalate) staple fiber is produced under similar conditions as those of Comparative Example 8, and is in excellent stability of melt-spinning procedure. The resultant hollow composite staple fiber exhibited a percentage crimp of 15% appropriately balanced with a bulk density of 23 cm<sup>3</sup>/g and an appropriate web area thermal shrinkage of 48%; of a monomer fabric produced from the hollow composite fibers.

However, the non-hollow (solid) composite staple fibers of Comparative Example 8 exhibited a poor stability in a melt-spinning procedure, a too-high percentage crimp of 22%, a too-low bulk density of a nonwoven fabric produced from the non-hollow fibers of 15% and a too-high web area thermal shrinkage of 68%.

The above-mentioned problems of the non-hollow side-by-side composite poly(trimethylene terephthalate) staple fibers of the Comparative Example 8 and also of Miyake

can be solved by the hollow side-by-side or eccentric core-in-sheath type composite staple fibers of the present invention.

Miyake is silent as to the problems of the non-hollow composite staple fibers of Miyake and how to solve the problems. Thus, Miyake does not teach or suggest the combination of Feature (A) with Features (B), (C) and (D) of the present invention. Therefore, Miyake does not render the present claims obviousness.

**Tanaka (U.S. 6,455,156)**

Tanaka discloses an islands-in-sea type composite fiber having, in a cross-section thereof, a sea portion formed from a thermoplastic polymer, such as a polyolefin or polyester fiber; and 7 or more island portions formed from a water-soluble polymer, such as polyvinyl alcohol.

When the islands-in-sea type composite fiber is treated in hot water, the water-soluble polymer island portions are dissolved and removed and converted to 7 or more hollows.

Tanaka does not teach or suggest hollow composite staple fibers having a side-by-side or eccentric core-in-sheath composite fiber structure provided with only one hollow part.

When Tanaka's 7 or more hollowed fiber structure is introduced into the composite polyester fiber of Miyake, the resultant composite fiber has 7 or more hollows. The 7 or more hollowed composite fibers are distinguishable from the hollow composite staple fibers having only one hollow part as recited in amended claim 1 of the present application.

Also, neither of Miyake nor Tanaka teaches suggests or provides any other motivation or reason to expect that the object of the present invention can be attained by the 7 or more hollowed composite fiber. Therefore, there is no reason to combine Miyake with Tanaka.

Accordingly, Applicant respectfully submit that withdrawal of the rejection is proper.

In view of the above, reconsideration and allowance of claims 1 and 2, and rejoinder and allowance of process claim 3 and 4 of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephonic interview, the Examiner is kindly requested to contact the undersigned attorney at the local Washington D.C. telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

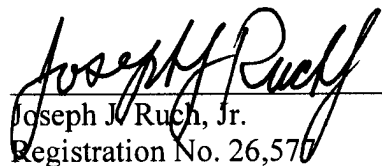
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WASHINGTON OFFICE

**23373**

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